BUTTE CITY (PWS # 6120002)
SOURCE WATER ASSESSMENT FINAL REPORT

December 9, 2003

State of Idaho
Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Butte City, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The Butte City drinking water system consists of two wells. Both wells have a high susceptibility rating to inorganic, synthetic organic, volatile organic and microbial contamination, due to a high rating in hydrologic sensitivity, a high rating for system construction, and roads (Birch and 8th) within 50 feet of the wellheads. Total coliform bacteria were detected in the distribution system in August 1996 and July 1998, but repeat samples have never recorded total coliform bacteria at the wells. The wells have not recorded volatile organic or synthetic organic contamination during any water chemistry tests. The inorganic contaminants fluoride, barium, chromium, arsenic, and iron have been detected, but at levels below the Maximum Contaminant Level (MCL). Nitrate concentrations have been recorded at levels below about 1.2 milligrams per liter (mg/L). The MCL for nitrate is 10 mg/L. Though there have not been chemical problems with the system water, Butte City should be aware that the potential for contamination from the aquifer still exists.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For Butte City, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Also, disinfection practices should be implemented if microbial contamination becomes a problem. No chemicals should be stored or applied within the 50-foot radius of the wellheads. The ground should be graded away from Birch and 8th Streets so that in the unlikely event of a spill, contaminants would flow away from the wells. Additionally, there should be a focus on implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources within the delineation zone. Since much of the designated protection areas are outside the direct jurisdiction of Butte City, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of source water protection. In addition, the wells should maintain sanitary survey standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies, even though these strategies may not yield results in the short term. A strong public education program should be a primary element of any drinking water protection plan, as the delineation crosses urban and residential land uses. Public education topics could include proper lawn care practices, household hazardous waste disposal methods, and the importance of water conservation to name a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. There are transportation corridors within the delineation, therefore the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies, please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR BUTTE CITY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The local community, based on its own needs and limitations, should determine the decision as to the amount and types of information necessary to develop a drinking water protection program. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for Butte City is comprised of two ground water wells that serve approximately 59 people through approximately 38 connections. The wells are located in Butte City, near the corner of Birch and 8th Streets (Figure 1).

There are no current significant potential water problems currently affecting Butte City. Total coliform bacteria have been detected in the distribution system in August 1996 and July 1998, though duplicate samples have never been found at the wellheads. Additionally, there have been detections in the tested well water of the inorganic contaminants (IOCs) fluoride, barium, chromium, arsenic, iron, and nitrate at levels below the current Maximum Contaminant Levels (MCLs). No volatile organic contaminants (VOCs) or synthetic organic contaminants (SOCs) have been detected in the well water.

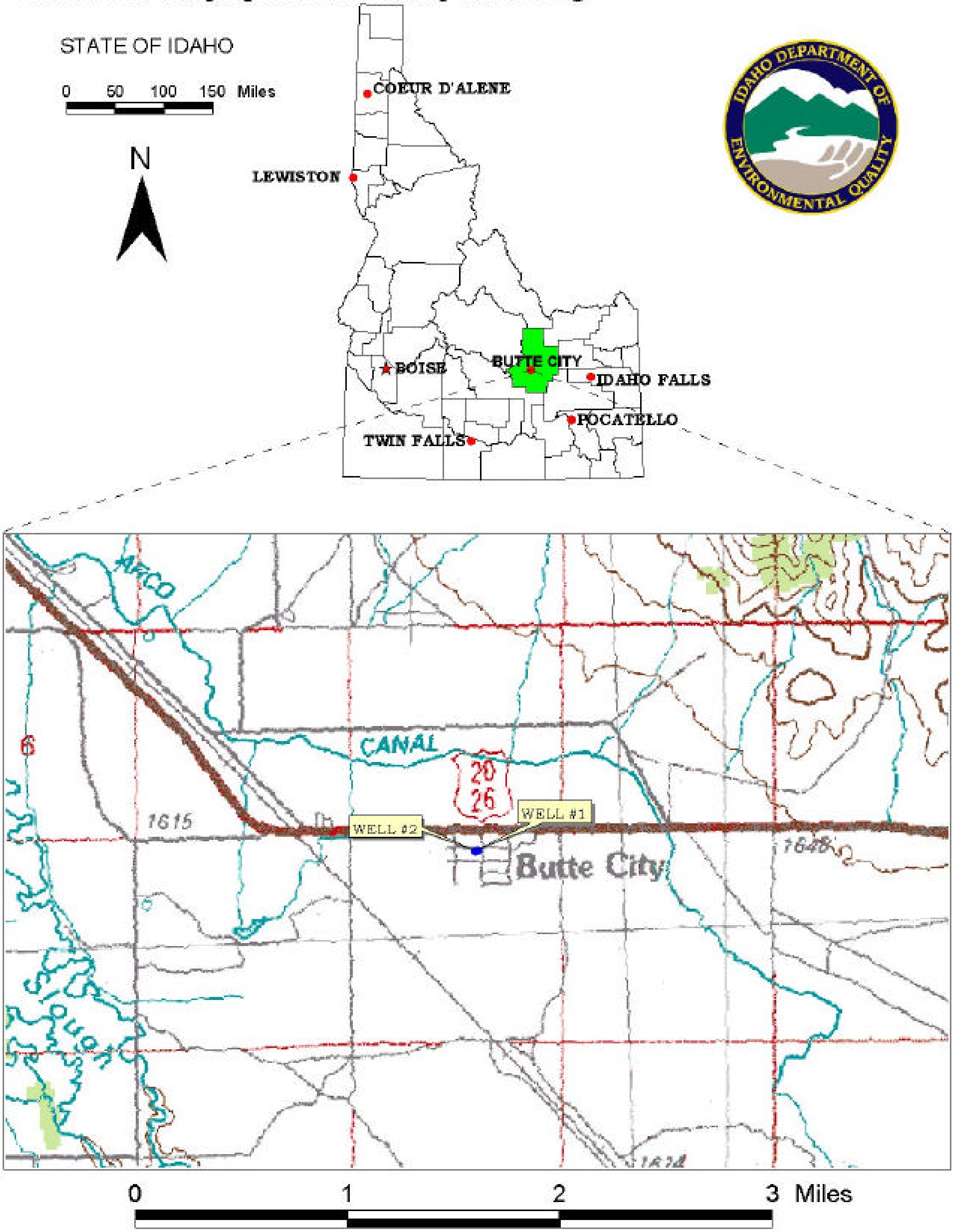
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with Washington Group, International (WGI) to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Big Lost River aquifer in the vicinity of the Butte City wells. The computer model used site-specific data, assimilated by WGI from a variety of sources including local area well logs and hydrogeologic reports (detailed below).

The Big Lost River basin occupies approximately 1,400 square miles at the northern side of the Eastern Snake River Plain (Szczepanowski, 1982). The basin is northwest to southeast trending and is bounded on the east by the Lost River Range and on the west by the White Knob Mountains. The adjacent mountains are composed of a sedimentary sequence of limestone, dolomite, quartzite, sandstone, shale, and argillite. Granitic rock occurs in some places within the sedimentary units, while volcanic materials cover an extensive area at higher elevations. Basalt from the Snake River Plain is also found at the surface in the south end of the Big Lost River basin.

The Big Lost River flows through the axis of the valley and is controlled by the Mackay Dam. An examination of the historical stream flow data (USGS, 2000a) indicates that base flow of the river near Mackay is relatively constant during the year, except during the summer months when the flow rate is increased. It is believed that the Big Lost River stage controls the regional ground-water levels. Flow in the Sharp Ditch (USGS, 2000b) along the eastern edge of the foothills is intermittent and occurs only in the summer months when irrigation demand is high.

FIGURE 1. Geographic Location of Butte City



The valley-fill sediments are present in two forms: cemented and unconsolidated. Calcite cement binds together fragments of sandstone, quartzite, and limestone of the old colluvial fans. The unconsolidated materials are composed of clay- to boulder-size particles and range greatly in degree of sorting. The alluvial fill varies from 2,000 to 3,000 feet thick in the Barton Flat area to over 5,000 feet east of Mackay (Szczepanowski, 1982, p. 5).

The primary source of water to the alluvial aquifer is precipitation at higher elevations that infiltrates through fractures in the bedrock. Some of the water is discharged to streams, and some continues downslope entering the valley alluvium. Numerous streams lose all their flow to the highly permeable colluvial fans found near the valley floor. Other sources of recharge include precipitation on the valley floor, irrigation, and leakage from canals. Annual precipitation within the basin is elevation-dependent and varies from 10 to 45 inches (Szczepanowski, 1982, p. 3).

Natural discharge of ground water occurs as gains to the Big Lost River, as underflow leaving the basin south of Arco, and as evapotranspiration where the water table is at or near the land surface.

The water table ranges in elevation from about 6,300 feet above mean sea level (ft msl) near Chilly to 5,200 ft msl south of Arco (Briar et al., 1996). Ground water flow direction generally follows the valley centerline toward the south and southeast. The valley fill aquifer generally is unconfined, although perched and artesian conditions are known to occur. Localized perched and artesian zones developed as the result of widely scattered lenses of low-permeability materials (Szczepanowski, 1982, p. 6).

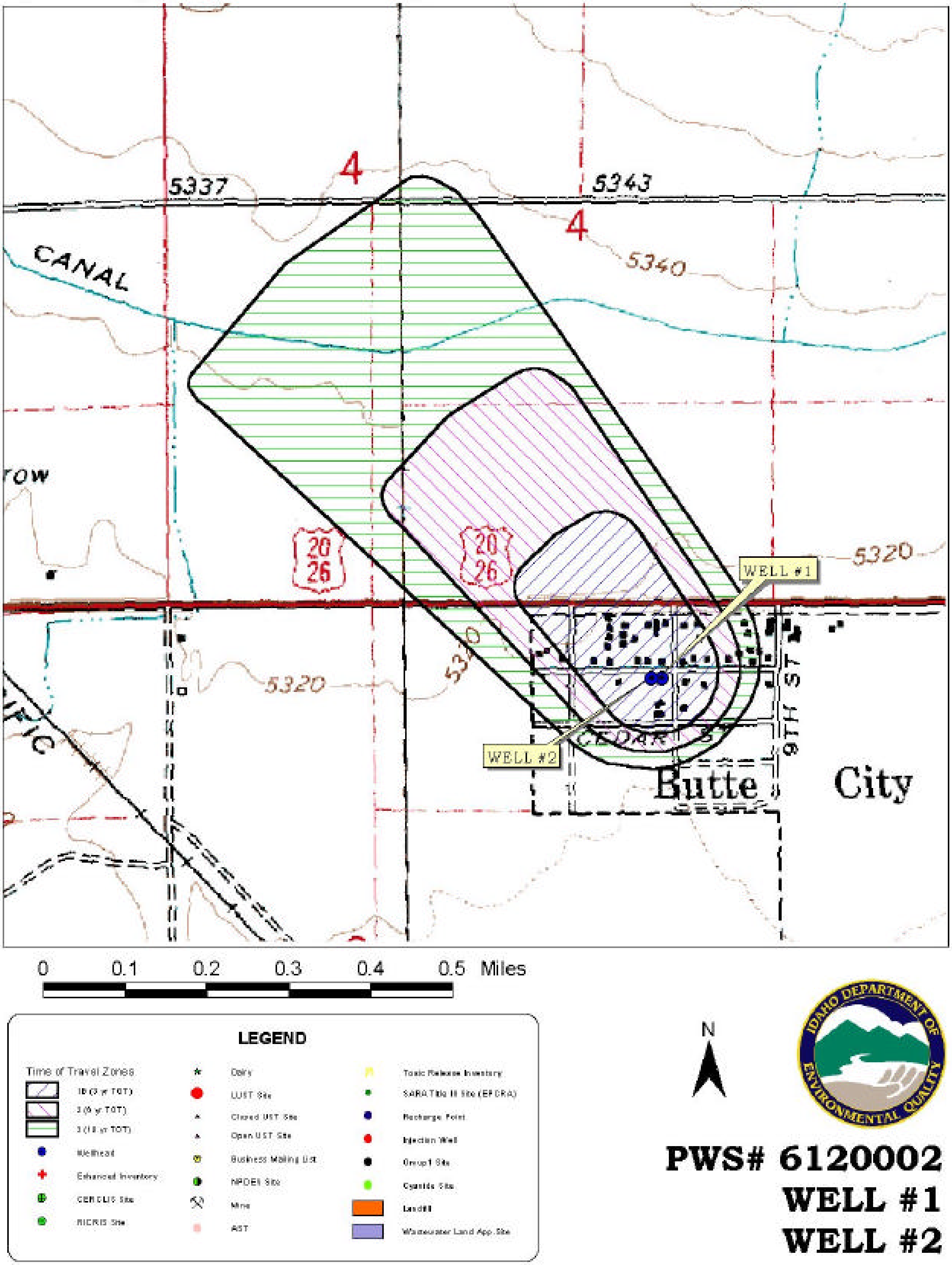
The delineated source water assessment area for Butte City wells can best be described as a corridor approximately 1 mile long and 0.4 miles wide extending to the northwest of Butte City (Figure 2). The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act, and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area of the Butte City wellheads consists of residential and urban uses, while the surrounding area is predominantly irrigated agriculture.

Figure 2. City of Butte Delineation Map and Potential Contaminant Source Locations



It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in August 2001. The first phase involved identifying and documenting potential contaminant sources within the Butte City source water assessment area (Figure 2) through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

The delineated source water area (Figure 2) has one major potential contaminant source: Highway 20/26. A spill along the section of the highway that crosses the delineation could contribute all classes of contamination to the aquifer.

Section 3. Susceptibility Analyses

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets for the system. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity is high for both wells (Table 2). Regional soils data shows that the delineation predominantly contains moderately to well-drained soils. Lack of Butte City well logs prevents a determination of the vadose zone composition, the depth of the water table, or the presence of laterally extensive low-permeability units to retard the downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced. A sanitary survey was conducted in April 1999.

Both wells have a high system construction score. Well #1, drilled in May 1952, is 465 feet deep, with 16-inch diameter casing to 89 feet below ground surface (bgs) and 12-inch diameter casing to 294 feet bgs. The highest production zone is likely greater than 100 feet below the water table. The 1999 sanitary survey specifies deficiencies with the sanitary seal and flood protection standards.

Well #2, drilled in 1956, is 465 feet deep, with 20-inch diameter casing to 88 feet bgs, 16-inch diameter casing to 308 feet bgs, and 12-inch diameter casing to 460 feet bgs. The highest production zone is likely greater than 100 feet below the water table. The 1999 sanitary survey specifies deficiencies with the sanitary seal and flood protection standards.

Without well logs, a determination could not be accurately made as to whether current public water system (PWS) construction standards are being met. Though the wells may have been in compliance with standards when they were completed, current PWS well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Eight-inch diameter wells require a casing thickness of at least 0.322-inches and 12-inch and larger diameter wells require a casing thickness of at least 0.375-inches. As such, the wells were assessed an additional point in the system construction rating.

Potential Contaminant Source and Land Use

The wells rate moderate for IOCs (i.e. nitrates, arsenic), VOCs (i.e. petroleum products), and SOCs (i.e. pesticides) and low for microbial contaminants (i.e. bacteria). Agricultural land uses in the delineated source areas account for the largest contribution of points to the potential contaminant inventory rating.

Final Susceptibility Ranking

A detection above a drinking water standard MCL or a detection of total coliform bacteria, fecal coliform bacteria, or *E*-coli bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. In this case, both wells automatically score high for all classes of contamination Birch Street and 8th Street are within the 50-foot sanitary setback distance of the wells. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, both wells rate high for all categories.

Table 1 Summary of Butte City Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	M	M	M	L	H	H(*)[2]	H(*)	H(*)	H(*)
Well #2	H	M	M	M	L	H	H(*)	H(*)	H(*)	H(*)

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
[2] H(*) = Well scores high and automatically high due to Birch and 8th Streets within 50 feet of the wells

Susceptibility Summary

Overall, both wells rate high for all categories. Proximity of roads within 50 feet of the wells leads to the automatic high rating. Lack of well log information led to the high ranking in hydrologic sensitivity and system construction. The deficiencies noted in the 1999 Sanitary Survey also contributed to the high scores.

There are no significant potential water problems currently affecting Butte City. Total coliform bacteria have been detected in the distribution system in August 1996 and July 1998, though duplicate samples have never been found at the wellheads. Additionally, there have been detections in the tested well water of the IOCs fluoride, barium, chromium, arsenic, iron, and nitrate at levels below the current MCLs. No VOCs or SOCs have been detected in the well water.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For Butte City, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary survey. If microbial contamination becomes a problem, appropriate disinfection practices should be implemented. No chemicals should be stored or applied within the 50-foot radius of the wellheads. The ground should be graded away from Birch and 8th so that in the unlikely event of a spill, contaminants would flow away from the wells. Additionally, there should be a focus on implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas, and awareness of the potential contaminant sources within the delineation zone. Since much of the designated protection areas are outside the direct jurisdiction of Butte City, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of source water protection. In addition, the wells should maintain sanitary survey standards regarding wellhead protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the short term. A strong public education program should be a primary element of any drinking water protection plan, as the delineation crosses urban and residential land uses. Public education topics could include proper lawn care practices, household hazardous waste disposal methods, and the importance of water conservation to name a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. As there are transportation corridors within the delineations, the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office	(208) 528-2650
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper (mharper@idahoruralwater.com), Idaho Rural Water Association, at 1-208-373-4001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Briar, D., S.M. Lawlor, M.A.J. Stone, D.J. Parliman, J.L. Schaefer, and D. Kendy, 1996, Ground-Water Levels in Intermontane Basins of the Northern Rocky Mountains, Montana and Idaho. U.S. Department of Interior – U.S. Geological Survey.

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United States Geological Survey, 2000b, Historical Streamflow Daily Values for Sharp Ditch Near Mackay, Idaho, http://waterdata.usgs.gov/nwis-w/ID/?statnum=13126500.

Attachment A

Butte City
Susceptibility Analysis
Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : BUTTE CITY OF   Well# : WELL #1 and #2

Public Water System Number 6120002   12/21/2001 10:52:54 AM

1. System Construction

		SCORE
Drill Date	05/02/1952	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	2000
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	NO	1
	Total System Construction Score	5

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2
	Total Hydrologic Score	6

3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES	YES
	Total Potential Contaminant Source/Land Use Score - Zone 1A	2	2	2	2

Potential Contaminant / Land Use - ZONE 1B

		IOC Score	VOC Score	SOC Score	Microbial Score
Contaminant sources present (Number of Sources)	YES	1	1	1	1
(Score = # Sources X 2) 8 Points Maximum		2	2	2	2
Sources of Class II or III leacheable contaminants or	YES	5	1	1	
4 Points Maximum		4	1	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
	Total Potential Contaminant Source / Land Use Score - Zone 1B	10	7	7	6

Potential Contaminant / Land Use - ZONE II

		IOC Score	VOC Score	SOC Score	Microbial Score
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
	Potential Contaminant Source / Land Use Score - Zone II	5	5	5	0

Potential Contaminant / Land Use - ZONE III

		IOC Score	VOC Score	SOC Score	Microbial Score
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
	Total Potential Contaminant Source / Land Use Score - Zone III	3	3	3	0

	IOC Score	VOC Score	SOC Score	Microbial Score
Cumulative Potential Contaminant / Land Use Score	20	17	17	8
4. Final Susceptibility Source Score	15	14	14	14
5. Final Well Ranking	High	High	High	High